Impact of SNB Decision to Unpeg the Franc from Euro on Financial Markets: Event Study Approach

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Abstract: The aim of this paper is to study the impact of Swiss National Bank (SNB) decision to unpeg the franc from euro, which was taken on 15th January, 2015, on main financial markets around the word. Our results shows that the stocks market reacted significantly in the event day (except stock market from Asia & Australia), when was recorded a significant decrease of 0.33% in the average return. Moreover, it seems that after 4 days there was recorded the highest significant decrease of global market return of 1.3%.

Keywords: event study; exchange rates; stock markets; Swiss franc

JEL Classification: G14, E44

1. Introduction

In our days things are happening very fast. Sometimes nature takes us by surprise and hurricanes, earthquakes, floods and other similar can cause a lot of losses, not only human losses but also financial one. Despite this, there are events caused by man, which are affecting the stock prices of different companies. Sometimes the effect is positive and it is causing an increase in stock price (announcement of dividend payment, profit realization, and others similar events) or contrary a decrease in stock price (theorist attack, losses realization, change company management, and others similar events).

Because of this, many researchers were interested in finding the exactly manner in which a stock price of a company is affected by different kind of event, to be able in the end to classify the events in two categories, as we mentioned before (events which cause an increase in stock prices and events which cause a decrease in stock prices).

Swiss National Bank, on January 15th, 2015, took the decision to unpeg the franc

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from euro. So based on this decision, the CHF started to appreciate with a significant values compared to EUR and USD in a very short period.

Through this paper we want to analyse more detailed the impact of SNB decision on main stock markets around the world, based on event study methodology.

The paper is organized as follows: in the first section we present the main types of events for which it can be applied the event study methodology, in the second section we present the methodology used, in the third section we present the main data, the fourth section highlights the main results, and the last section concludes the paper.

2. Literature Review

Some researcher tried to understand the economic and financial implication of a natural disaster: earthquakes, floods, cyclones, and bushfires. As it is emphasized in the literature, these events might cause shutting down activities not only in the affected area, but also in other far area. Going further, sometimes these disasters can be a boosting factors for economy. The history proved us that big hurricanes such as hurricane Camille from 1969, hurricane Hugo from 1989 or hurricane Andrew from 1992 determined an outperforming of companies from construction industry (Tara Denise Barton, 2005).

In the same time, it seems that bushfires, cyclones and earthquakes have a major effect on market returns, unlike severe storms and floods (Worthington and Valadkhani, 2004). The devastating attack against United States on September 11th, 2001, by hijacking four planes of two big American Airline Company had a great impact on financial markets and especially on the stock prices of airlines companies. Kilroy (2001) stated that, the most affected by the terrorist attack were the airline and travel industries, due to fact that United States commercial passenger traffic was dropping nearly 40% between September 10th and October 10th 2001.

Going further, Korolyi and Martell (2005) emphasize that the attacks in countries wealthier and more democratic, are associated with larger negative share price reaction. Mergers and acquisitions have been for a long period of time considered major events in a firm's life. Acquisitions are a well-recognized method for rapidly capturing desirable resources and establishing a greater degree of control over one's environment (Barney, 1988) Another important finding is that acquirers at best break even in terms of stock market reactions, with target shareholders expropriating the majority of the abnormal returns.

In order to focus more on our topic research, we search in literature the main papers which analysed the impact of different kind of regulation on stock price evolution. Regarding this, one of the most analysed regulations is represented by Securities Acts from 1933 ad 1934, as is stated by Beardsley and O'Brian (2003), and based on

the previous research the disclosure requirements imposed by the Act didn't have an impact upon mean returns. Another regulation analysed by researchers was represented by the Regulation FD (Fair Disclosure) adopted by U.S. Securities and Exchange Commission (SEC) on August 15th, to address the selective disclosure of information by publicly traded companies. Regarding this topic, Heflin et al. (2003) was interested in finding if stock return volatility has been influenced by adoption of this new rule. Through their paper, they showed that adoption of regulation FD didn't increase return volatility, so the alarms which were raised by financial market were not founded. SNB decision from January 15th, 2015, it is very important because affects the most important financial markets. Therefore, through this paper we want to analyse empirically the effect caused by this decision, on the main stock markets around the world. Through this paper we want to analyse more detailed the impact of SNB decision on main stock markets around the world, based on event study methodology.

3. Methodology

Our methodology used to find the impact of the SNB decision from January 15th, 2015 to unpeg the franc from euro, on the main stock markets around the world, is represented by the event study methodology, due to fact that the timing of this decision was not predictable. This type of methodology is extensively used in the literature to highlight the impact of a variety of events, such as: mergers, dividend announcement, antitrust actions, announcements of accounting rule changes, investor reactions to major catastrophes, and for evaluating the equity impacts of regulatory reform in the transportation industries, as pointed out by Bruning and Kuzma (1989).

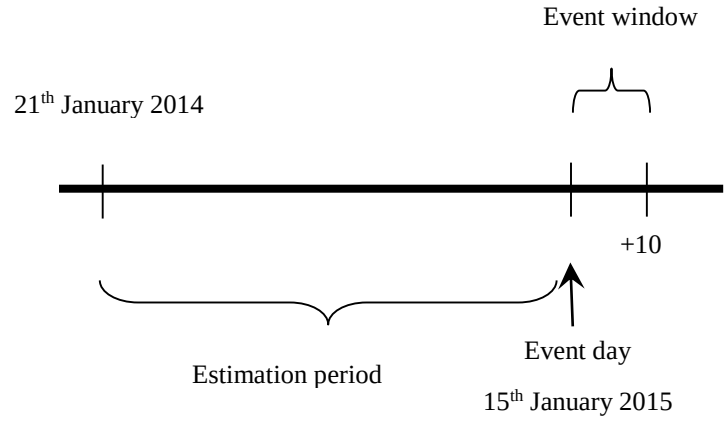

Figure 1. Estimation period and event period

In our case the event day named day "0" is January 15th, 2015. For each index we used a maximum of 250 daily returns for estimation period, as it is highlighted by the previous studies that a value of 250 days is corresponding to the number of trading days in a year (Corrado, 2011; Brown and Warner, 1984).

In figure 1 we are able to see the estimation period of 250 days (-250 through -1) and the event period of 11 days (0 through +10). In our study we compute the daily return based on formula (1).

$$R_t = \log(\frac{P_t}{P_{t-1}}), \quad t = -249,-239,-238,....,+8,+9,+10 \tag{1}$$

where R_t - return at time t, P_t - price at moment t and P_{t-1} - price at time $t-1$.

Due to fact that the decision took by SNB on January 15th, 2015 to unpeg the franc from euro, highly affected the exchange rates, we would expect R_t to react significantly.

The value of R_t can be expressed in two manners: R_t as normal/expected return and R_t as abnormal return. The expected return is computed based on market model, using the regression presented in formula (2):

$$E(R_t) = \alpha + \beta \times R_{Mt}, t = 0,+1,+2,....,+8,+9,+10 \tag{2}$$

where α and β are obtained by estimating the regression between the return of each index and the global market return, based on formula (3):

$$R_t = \alpha + \beta \times R_{Mt}, \quad t = -250,-238,-237,....,-3,-2,-1 \tag{3}$$

The R_{Mt} is the return of the global market at moment t, and usually it is estimated as the return on a broad-based market index. In our case we will use a global market index namely STOXX Global Total Market Index (TMI), which represents 95 percent of the free float market capitalization worldwide.

The next step in our analysis is to compute the abnormal (unexpected) return defined as the difference between the real return and expected return.

$$Ab_t = R_t - E(R_t), \quad t = 0,+1,+2,....,+8,+9,+10 \tag{4}$$

Despite this, there is another useful statistic – Cumulative Abnormal Return (CAR), being helpful in indicating a pattern in which the price index reacts to the event. This indicator is estimated according to formula (5):

$$CAR_t = \sum_{k=-10}^{t} Ab_k, \tag{5}$$

First tested aspect was to find if there was significant average abnormal return

recording on stock markets as reaction to the SNB decision. More exactly, using a two-tailed t-test, we check if the average abnormal return of each main stock market for the day *i*, (*i*= 0 to +10) is statistically significant different by 0, based on the hypothesis from relation (6):

$$H_0 : \overline{Ab}_i = 0; \\ H_1 : \overline{Ab}_i \neq 0. \tag{6}$$

4. Data Collection and Descriptive Statistics

In the analysis we included the most important stock markets from the world: stock market from North America, stock market from Europe and stock market from Asia, in order to check the effect of SNB decision to unpeg the franc from euro on these three important markets. The indices selected from each market and the data sources are presented in table 1.

All indices values were denominated in EUR, based on the exchange rates available on European Central Bank.

Table 2. Data Source

Market	Index	Currency	Data source - link
North America	S&P 500	USD	http://finance.yahoo.com/stock-center/
	NYSE Composite	USD	
	NASDAQ Composite	USD	
	DJIA	USD	
	AMEX Composite	USD	
Europe	FTSE 100	GBP	http://finance.yahoo.com/stock-center/
	CAC40	EUR	
	DAX	EUR	
	EURONEXT BEL-20	EUR	
	ATX	EUR	
Asia & Australia	NIKKEI 225	JPY	http://finance.yahoo.com/stock-center/
	HSI	HKD	
	AORD – Australian Index	AUD	
	BSESN (Bombay)	INR	
	NZX 50	NZD	
Global	TW1P	EUR	http://www.stoxx.com/indices/types/benchmark.html
Exchange rates	AUD/EUR	-	https://www.ecb.europa.eu/stats/exchange/eurofxref/html/index.en.html
	EUR/CHF	-	
	EUR/GBP	-	
	EUR/USD	-	

	HKD/EUR	-
	IDR/EUR	-
	INR/EUR	-
	JPY/EUR	-

Descriptive statistics of daily returns computed after I denominated the values for all indices in EUR, expressed in percentages are presented in table 2. All financial indices, except ATX index and FTSE100, have a positive average return for the analysed period. Going further, we are able to see that stock market from North America has a higher return compared to the stock market from Europe and Asia. Regarding this, the stock market from North America recorded an average return of 0.11%, while the stock market from Europe recorded an average return of 0.02%, and stock market from Asia (excluding BSESN index) recorded an average return of 0.09%.

Another interesting fact is represented by the values for skewness, because the stock market from Europe record a negative value of this statistical measure, which inform us that in the analysed period, the majority daily returns recorded on the market were higher than the average, while in case of American and Asian market we have the opposite, so the majority daily return for the analysed period were less than average.

Table 2 Descriptive statistics

	Variable	Mean	Median	Max.	Min.	St. dev.	Skewness	Kurtosis
North America	AMEX	0.0010	0.0008	0.0387	-0.0324	0.0095	0.03	4.99
	DJIA	0.0012	0.0010	0.0372	-0.0292	0.0087	0.15	4.94
	NASDAQ	0.0013	0.0014	0.0384	-0.0368	0.0102	-0.09	4.53
	NYSE	0.0010	0.0008	0.0345	-0.0317	0.0085	0.14	5.11
	SP500	0.0013	0.0012	0.0369	-0.0302	0.0088	0.10	5.08
Europe	ATX	-0.0006	0.0000	0.0281	-0.0439	0.0108	-0.58	4.29
	CAC40	0.0005	0.0010	0.0352	-0.0370	0.0109	-0.14	4.06
	DAX	0.0006	0.0009	0.0330	-0.0350	0.0112	-0.14	3.61
	EURONEXT	0.0009	0.0009	0.0341	-0.0337	0.0088	-0.09	4.86
	FTSE100	-0.0003	-0.001	0.0275	-0.0272	0.0083	-0.10	3.87
Asia & Australia	AORD	0.0005	0.0009	0.0234	-0.0277	0.0093	-0.14	3.22
	BSESN	0.0022	0.0016	0.0472	-0.0405	0.0115	0.16	5.27
	HSI	0.0012	0.0015	0.0480	-0.0328	0.0101	0.14	4.66
	NIKKEI225	0.0009	0.0009	0.0446	-0.0371	0.0113	0.05	4.46

	NZX50	0.0009	0.0006	0.0255	-0.0318	0.0074	-0.05	4.50
	TW1P	0.0010	0.0009	0.0282	-0.0193	0.0071	0.32	4.17

5. Results

The first step, before applying the event study methodology, it is to check if all the time series are stationary. Based on Augmented Dickey-Fuller test, we obtained that all series are stationary at 1% significance level.

Second step is to estimate the regression model between each index's return and global market return, which are used to compute the expected return during the event window. Based on expected returns and real return we compute the abnormal return for each day from the window period for each single index. After that we will test if the average abnormal return for each market and the total market is different by 0. The results for two side t-test are presented in table 3.

At a first glance we can see that in the day of the event, there is recorded a negative abnormal return for all groups, except Asia and Australia, for which a negative abnormal return it is recorded on the day 1. This it is easy to explain, to do the local time zone.

Despite this, we are able to see that after 3-4 day, all financial markets around the word have encountered some highly significant abnormal return, which means that the impact of this decision, started to cause some more important effects. As we know, there were several cases in which hedge-funds were closed – the case of Everest Capital LLC's Global which had $830 million in assets, or other situations in which the funds suffered significant losses: Discovery Capital Management LLC, (the firm manages $14.7 billion), and Comac Capital LLP (the firm manages $1.2 billion), as it is stated by Copeland (2015).

Table 3. Statistical significance testing for abnormal returns

Event day	Global market		North America		Europe		Asia & Australia	
	$\overline{Ab}$	*t*-test	$\overline{Ab}$	*t*-test	$\overline{Ab}$	*t*-test	$\overline{Ab}$	*t*-test
0	***-0.0033***	***-0.236***	***-0.0171***	***-4.619****	***-0.0005***	***-0.217***	***0.0148***	***3.632****
1	***0.0005***	***-0.067***	***0.0096***	***9.846****	***-0.0033***	***-1.687***	***-0.0067***	***-3.474****
2	**0.0058**	**2.99****	0.0025	2.44*	**0.0128**	**11.127****	0.0055	0.868
3	0.0017	1.533	-0.0021	-1.706	0.0054	1.603	0.0044	1.478
4	**-0.0129**	**-10.61****	**-0.0132**	**-12.55****	**-0.0106**	**-7.959****	**-0.0169**	**-5.55****
5	**0.0257**	**5.802****	**0.0327**	**17.6****	0.0077	1.089	**0.0373**	**6.925****
6	**-0.0121**	**-7.781****	**-0.0168**	**-9.005****	**-0.0062**	**-3.752****	**-0.0123**	**-6.437****
7	**0.0037**	**2.578****	-0.0006	-0.162	**0.0062**	**4.905****	0.0117	2.744*
8	-0.0013	-1.011	**-0.0138**	**-8.617****	0.0037	1.086	0.0024	0.853
9	-0.0004	-0.45	**0.0102**	**7.57****	0.0001	0.071	**-0.0146**	**-2.838****
10	**-0.0070**	**-3.417****	**-0.0115**	**-8.997****	-0.0046	-1.777	-0.0033	-0.749

***,**,* - the null hypothesis is rejected at 1%, 5%, respectively 10% significance level

Going further, we wanted to see if there was some arbitrage opportunity due to this unexpected event between the exchange market from US and the exchange market from EU.

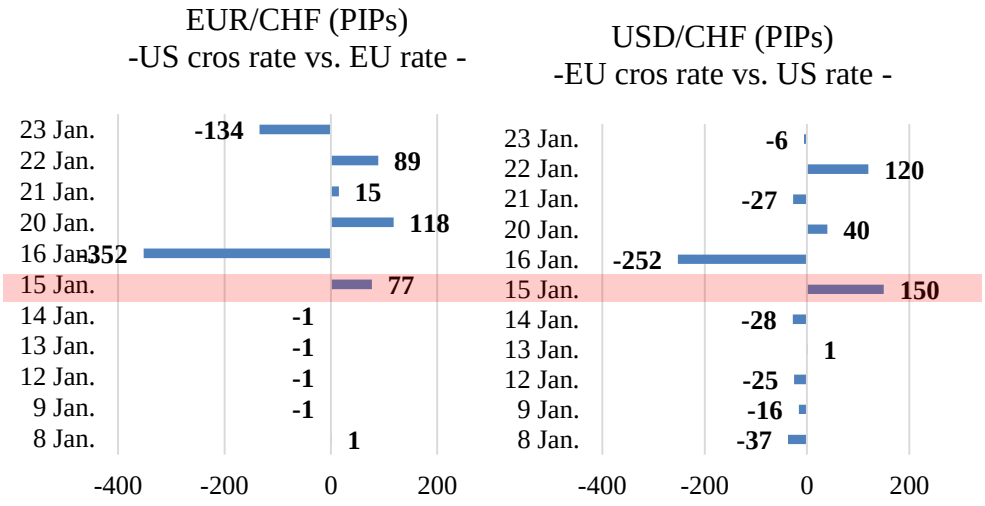

Figure 2. Calculated differences in PIPs between the cross rate and official rate

In figure 2, we presented the difference between the official exchange rate from UE/US and the calculated cross rate from the other country US/EU, for both exchange rates EUR/CHF and USD/CHF, for five days before the event and five days after the event. We are able to see that in the week before the event there are very small differences between the official exchange rate from a country and the corresponding cross rate calculated in the other country. In the case of EUR/CHF there is a difference of only 1 PIP between the exchange rates, while in case for USD/CHF there is a difference of around 1 – 37 PIPs. This mean that there is no opportunity for arbitrage.

Going further, in the week after 15th January, there are recorded much higher differences between the exchange rates. This is a signal that there was some opportunity for arbitrage in the market. In the same time, this differences highlight that there was a general uncertainty regarding the evolution of the exchange rate for CHF, due to fact that many financial institution, as I mentioned above recorded big loses after the decision were applied, and in a some way it was created a mini effect of domino.

6. Conclusion

Through this paper we wanted to point out that the SNB decision from January 15th, to unpeg the franc from euro had a significant impact on main financial markets. In order to achieve this, we selected five stock indices from the stock market from North America, stock market from Europe and stock market from Asia.

The methodology used in our paper in order to highlight the impact of the SNB decision, on the main stock markets is represented by the event study methodology. The reasoning to use this is because the timing of this decision was not predictable, as it is pointed in the literature (Bruning and Kuzma, 1989).

Our results pointed out the fact that in the event day, there is recorded a negative impact on al stock market except Asia and Australia, for which a negative abnormal return it is recorded on the day 1. Moreover, the effect of unpeg the CHF from EUR had felt more strongly after 3-4 days after the event day, result supported by the real facts, because several hedge funds suffered huge losses after few days from the decision approval (Everest Capital LLC's Global, Discovery Capital Management LLC, and Comac Capital LLP).

We were able to see that even if before the event day, there were not big differences between the official exchange rate from a EU / US and the corresponding cross rate calculated in the other country, in the week after the event, there are recorded much higher differences between the exchange rates.

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